

REMARKS/ARGUMENTS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-56 are presently pending in this application, Claims 1, 12 and 22 having been amended and Claims 54-56 having been added by the present amendment.

In the outstanding Office Action, Claim 1-35, 37-41, 43, 45, 47, 49, and 50 were rejected under 35 U.S.C. 102(b) as being anticipated by Terui (U.S. Patent 4,955,062).

However, Claims 36, 42, 44, 46, 48, 51, 52 and 53 were indicated as being allowable if rewritten in independent form. Applicant acknowledges with appreciation the indication of allowable subject matter.

Amended Claims 1, 12, 22 and new Claims 54-56 are fully supported by the specification, drawings and claims as originally filed. Applicants therefore submit that no new matter has been introduced.

Briefly recapitulating, Claim 1 is directed to a mark detection method of detecting a mark formed on an object. The mark detection method includes measuring a surface state of an area of the object which includes, in a predetermined direction, a mark-formed area where the mark is formed and a no-mark area formed on the outside in the predetermined direction of the mark-formed area. The no-mark area has a characteristic compared to other areas. Further, the method includes extracting, while running a window having a dimension substantially coincident with the no-mark area in a signal process relatively to a signal measured in the measuring and obtaining at least one quantity denoting the surface state of an area in the window moving across the no-mark area having a characteristic based on measurement results through the window in the measuring, an area having a measurement result reflecting the mark based on the at least one quantity varying with position of the window.

Terui discloses that a plurality of windows,  $W_1$ ,  $W_2$ , ...and  $W_N$  are set with regard to a

light image of a mark pattern M. However, Terui neither discloses nor suggests **running the window  $W_N$  relatively to the light image of the mark pattern**. Terui further discloses a plurality of windows each of which covers both of a no-mark area and a mark area. However, Terui neither discloses nor suggests **a window having a dimension substantially coincident with a no-mark area**.

Accordingly, Terui is not believed in any way to anticipate the specific features recited in Claim 1. Therefore, Claim 1 is believed to be allowable.

Likewise, independent Claims 12 and 22 include subject matter substantially similar to what is recited in Claim 1 to the extent discussed above. Thus, Claims 12 and 22 are also believed to be allowable.

Substantially the same arguments as set forth above with regard to Claim 1 also apply to dependent Claims 2-11, 43, 44, 51 and 54, which depend directly or indirectly from Claim 1; dependent Claims 13-21, 45, 46 and 52, which depend directly or indirectly from Claim 12; and dependent Claims 23-28, 49, 55 and 56, which depend directly from Claim 22. Accordingly, each of the dependent claims is also believed to be allowable.

Claim 29 is directed to a mark detection method of detecting a mark formed on an object. The mark detection method includes measuring a surface state of an area of the object which includes the mark in a predetermined direction. The method includes extracting, after obtaining first at least one feature-quantity denoting the surface state of each of partitioned areas of the area based on measurement results obtained in the measuring, a predetermined area having a measurement result reflecting the mark based on the first at least one feature-quantity. The method further includes obtaining a second feature-quantity that is different from the first at least one feature-quantity and that denotes a feature of the surface state of the predetermined area based on the measurement result of the predetermined area extracted the extracting. A position of the mark in the predetermined direction is detected based on the second

feature-quantity.

Terui discloses that the moment  $M(x)$  is obtained for each window  $W_i$ , that a zero-cross point (the center  $X_c$ ) is detected for each window  $W_i$  according to the obtained moment  $M(x)$ , that a histogram concerning the center  $X_c$  is prepared for each window  $W_i$ , and that subsequently the center  $X_c'$  of the mark pattern  $M$  is determined on the basis of the peak value in the histogram and the center of gravity of the histogram curve in the neighborhood of the peak value.<sup>1</sup>

However, Terui fails to disclose that a quantity (a first feature-quantity) used when extracting a predetermined area is different from a quantity (a second feature-quantity) used when detecting a position of a mark within the extracted predetermined area.

Instead, in the Terui reference, only the first feature-quantity is used without using a second feature-quantity that is different from the first feature-quantity. Namely, a quantity (the first feature-quantity) which is used to extract the predetermined area (an area that is estimated to be a center of a mark pattern  $M$ , i.e. the peak value and its neighborhood) from the image data obtained for each of a plurality of windows  $W_i$  is shown in the histogram of Fig. 5, i.e. the histogram concerning the center  $X_c$  of each window  $W_i$  illustrates the first quantity. Further, in the processing after extracting the predetermined area, a quantity (the first feature-quantity) which was used to determine the center  $X_c'$  of the mark pattern  $M$  is also shown in the histogram of Fig. 5 (the peak value of the histogram and the histogram curve in the neighborhood of the peak value).

Accordingly, Terui is not believed in any way to anticipate the specific features recited in Claim 29. Therefore, Claim 29 is believed to be allowable.

Likewise, independent Claim 37 includes subject matter substantially similar to what is recited in Claim 29 to the extent discussed above. Thus, Claim 37 is also believed to be

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<sup>1</sup> Terui, Fig. 5 and col. 6, lines 19-56.


allowable.

Substantially the same arguments as set forth above with regard to Claim 29 also apply to dependent Claims 30-36, 47, 48 and 53 which depend directly or indirectly from Claim 29, and dependent Claims 38-42 and 50, which depend directly or indirectly from Claim 37. Accordingly, each of the dependent claims is also believed to be allowable.

Consequently, in view of the present amendment and in view of the indication of allowable subject matter, it is respectfully submitted that this application is in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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